

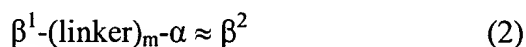
## AMENDMENT

### In the Claims:

Please amend the claims as follows:

### Please replace the presently pending claims with the following claims:

1. (Twice amended) A method to provide a subject with glycoprotein hormone activities which method comprises administering to a subject in need of said activities a composition of the formula:



wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone, or a variant thereof;

C<sub>1</sub> "α" has the amino acid sequence of the α subunit of a vertebrate glycoprotein hormone or a variant thereof;

"linker" is a linker moiety; and

"≈" is a noncovalent link between α and  $\beta^2$ ;

m is 0 or 1;

wherein each of  $\beta^1$  and  $\beta^2$  is the native β subunit of the same glycoprotein hormone or a variant thereof.

2. The method of claim 1 wherein  $\beta^1$  and  $\beta^2$  are native β subunits.

3. The method of claim 1 wherein  $\beta^1$  and  $\beta^2$  exhibit different biological half-lives.

4. (Amended) The method of claim 1 wherein one of  $\beta^1$  and  $\beta^2$  confers agonist activity and the other confers antagonist activity.

C<sub>2</sub> → 9<sub>1</sub> D (Amended) The method of claim 1 wherein said subject is being treated <sup>to</sup> ~~for~~ enhanced fertility.

C3 10/6. (Twice amended) The method of claim 9 wherein  
both  $\beta^1$  and  $\beta^2$  confer FSH agonist activity on said composition; or  
both  $\beta^1$  and  $\beta^2$  confer CG agonist activity; or  
both  $\beta^1$  and  $\beta^2$  confer LH antagonist activity.

11/7. (Amended) The method of claim 1 wherein said subject is being treated so as to  
become infertile or to remain infertile.

C4 12/8. (Amended) The method of claim 11 wherein both  $\beta^1$  and  $\beta^2$  confer FSH antagonist  
activity on said composition; or  
wherein both  $\beta^1$  and  $\beta^2$  confer CG antagonist activity; or  
wherein both  $\beta^1$  and  $\beta^2$  confer LH agonist activity.

[ 13/9. The method of claim 1 wherein the subject is in need of treatment for polycystic  
ovarian disease.

14/10. (Twice amended) The method of claim 13 wherein  
both  $\beta^1$  and  $\beta^2$  confer FSH agonist activity; or  
both  $\beta^1$  and  $\beta^2$  confer LH antagonist activity.

C5 25/11. (Twice amended) A glycosylated or nonglycosylated composition of the formula  
 $\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1$  (1); or  
 $\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2$  (2)  
wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate  
glycoprotein hormone, or a variant thereof;

" $\alpha$ " has the amino acid sequence of the  $\alpha$  subunit of a vertebrate glycoprotein hormone or  
a variant thereof;

"linker" is a linker moiety; and

" $\approx$ " is a noncovalent link between  $\alpha$  and  $\beta^2$ ;

m is 0 or 1;

wherein each of  $\beta^1$  and  $\beta^2$  is the native  $\beta$  subunit of the same glycoprotein hormone or a  
variant thereof.

~~30~~<sup>12</sup> (Twice amended) A pharmaceutical composition which regulates the glycoprotein hormone concentrations in a mammal which comprises an effective amount of the composition of the formula

$$\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1 \quad (1); \text{ or}$$

$$\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2 \quad (2)$$

in admixture with at least one pharmaceutically acceptable excipient; and

wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone, or a variant thereof;

C5 "α" has the amino acid sequence of the α subunit of a vertebrate glycoprotein hormone or a variant thereof;

"linker" is a linker moiety; and

"≈" is a noncovalent link between α and  $\beta^2$ ;

each of m and n is independently 0 or 1;

wherein each of  $\beta^1$  and  $\beta^2$  is the native β subunit of the same glycoprotein hormone or a variant thereof.

~~26~~<sup>25</sup> 21. (Amended) The composition of claim ~~11~~<sup>25</sup>, wherein  $\beta^1$  is FSHβ or a variant thereof and  $\beta^2$  is FSHβ or a variant thereof.

~~27~~<sup>25</sup> 22. (Amended) The composition of claim ~~11~~<sup>25</sup>, wherein  $\beta^1$  is LHβ or a variant thereof and  $\beta^2$  is LHβ or a variant thereof.

C6 ~~28~~<sup>25</sup> 23. (Amended) The composition of claim ~~11~~<sup>25</sup>, wherein  $\beta^1$  is TSHβ or a variant thereof and  $\beta^2$  is TSHβ or a variant thereof.

~~29~~<sup>25</sup> 24. (Amended) The composition of claim ~~11~~<sup>25</sup>, wherein  $\beta^1$  is CGβ or a variant thereof and  $\beta^2$  is CGβ or a variant thereof.

Please cancel claims 25-28.

Please add the following claims:

15/29. (New) The method of claim 1, wherein both of  $\beta^1$  and  $\beta^2$  confer agonist activity.

20/30. (New) The method of claim 1, where both of  $\beta^1$  and  $\beta^2$  confer antagonist activity.

D 5/31. (New) The <sup>method</sup>~~composition~~ of claim 4, wherein  $\beta^1$  is FSH $\beta$  or a variant thereof and  $\beta^2$  is FSH $\beta$  or a variant thereof.

D 6/32. (New) The <sup>method</sup>~~composition~~ of claim 4, wherein  $\beta^1$  is LH $\beta$  or a variant thereof and  $\beta^2$  is LH $\beta$  or a variant thereof.

D 7/33. (New) The <sup>method</sup>~~composition~~ of claim 4, wherein  $\beta^1$  is TSH $\beta$  or a variant thereof and  $\beta^2$  is TSH $\beta$  or a variant thereof.

D 8/34. (New) The <sup>method</sup>~~composition~~ of claim 4, wherein  $\beta^1$  is CG $\beta$  or a variant thereof and  $\beta^2$  is CG $\beta$  or a variant thereof.

C7 16/35. (New) The <sup>method</sup>~~composition~~ of claim 29, wherein  $\beta^1$  is FSH $\beta$  or a variant thereof and  $\beta^2$  is FSH $\beta$  or a variant thereof. 15

D 17/36. (New) The <sup>method</sup>~~composition~~ of claim 29, wherein  $\beta^1$  is LH $\beta$  or a variant thereof and  $\beta^2$  is LH $\beta$  or a variant thereof. 15

D 18/37. (New) The <sup>method</sup>~~composition~~ of claim 29, wherein  $\beta^1$  is TSH $\beta$  or a variant thereof and  $\beta^2$  is TSH $\beta$  or a variant thereof. 15

D 19/38. (New) The <sup>method</sup>~~composition~~ of claim 29, wherein  $\beta^1$  is CG $\beta$  or a variant thereof and  $\beta^2$  is CG $\beta$  or a variant thereof. 15

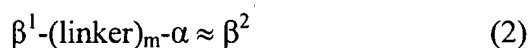
39. (New) The composition of claim 30, wherein  $\beta^1$  is FSH $\beta$  or a variant thereof and  $\beta^2$  is FSH $\beta$  or a variant thereof.

40. (New) The composition of claim 30, wherein  $\beta^1$  is LH $\beta$  or a variant thereof and  $\beta^2$  is LH $\beta$  or a variant thereof.

41. (New) The composition of claim 30, wherein  $\beta^1$  is TSH $\beta$  or a variant thereof and  $\beta^2$  is TSH $\beta$  or a variant thereof.

42. (New) The composition of claim 30, wherein  $\beta^1$  is CG $\beta$  or a variant thereof and  $\beta^2$  is CG $\beta$  or a variant thereof.

43. (New) A method to enhance fertility in a subject being treated for enhanced fertility which method comprises administering to said subject a composition of the formula:



wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone, or a variant thereof;

" $\alpha$ " has the amino acid sequence of the  $\alpha$  subunit of a vertebrate glycoprotein hormone or a variant thereof;

"linker" is a linker moiety; and

" $\approx$ " is a noncovalent link between  $\alpha$  and  $\beta^2$ ;

m is 0 or 1;

with the proviso that when one of  $\beta^1$  and  $\beta^2$  is a CG $\beta$  agonist then the other is not an FSH $\beta$  agonist.

44. (New) The method of claim 43, wherein one of  $\beta^1$  and  $\beta^2$  confers FSH agonist activity and the other confers LH antagonist activity; or  
one of  $\beta^1$  and  $\beta^2$  confers LH antagonist activity and the other confers CG agonist activity.